ADVENTURES

IN WESTERN NEW YORK HISTORY

Power The Gift of Niagara

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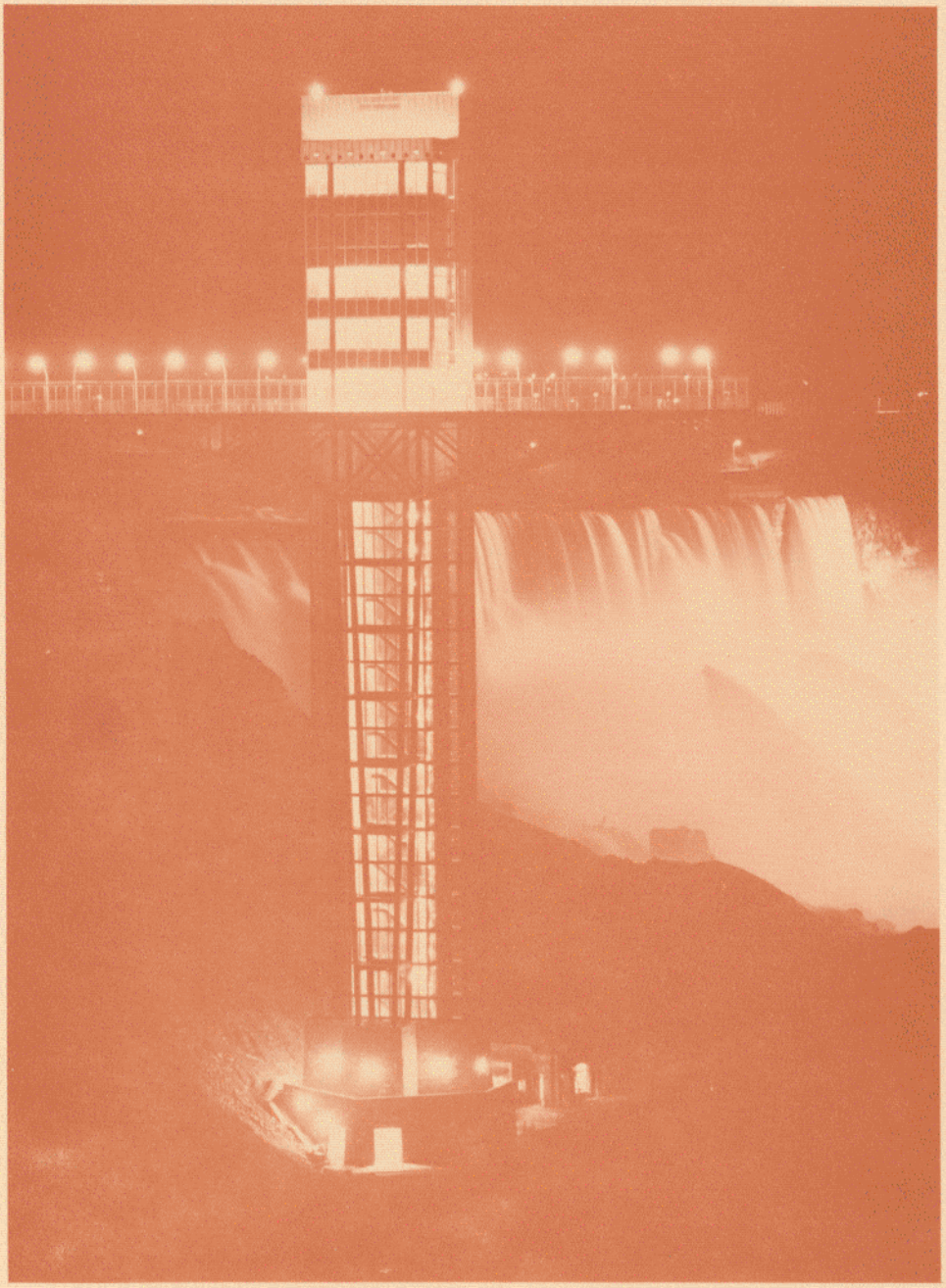

Night View of Observation Tower, American Falls:
—photograph, Power Authority of the State of New York.

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POWER, THE GIFT OF NIAGARA

By John Aiken and Richard Aiken

THE SOURCE OF NIAGARA POWER

Far from the mighty waterfalls and high in the sky above the Great Lakes begins our story of Niagara power. Here, a never-ending cycle takes place that provides the power for Niagara — a power made possible by the wind and the sun. The wind, carrying warm air from the Great Plains, sweeps eastward across the sprawling chain of inland seas. The warm breezes pick up moisture and carry it aloft into the cold upper air. Here the moisture cools. Clouds form. They blacken and deepen into thunderheads that shoulder out the sun. For an instant, the wind dies; suddenly, it stiffens. Then comes the rain; sometimes a downpour, sometimes a drizzle.

The wind sweeps the rain eastward over Lakes Superior, Michigan, Huron, Erie, and surrounding shores. From an area of some 265,000 square miles this rainwater drains into countless streams that flow into the lakes.

In time, the rainstorm finds its way to the Atlantic Ocean. Over the Great Lakes region the rain stops and the clouds break. Then the cycle begins again. Sunlight pours through to warm earth and air; wind gathers up moisture from land and water, and clouds take shape. Rain falls, and again water drains into the lakes.

The lakes swell and water starts flowing eastward. From Lake Superior it runs through narrow straits into Lakes Huron and Michigan. At the southern end of Lake Huron it again crowds into a narrow waterway, then is passes Detroit's smokestacks and sweeps through the Detroit River into Lake Erie. Past the sprawling smudge of Cleveland, the water moves across the lake on its journey to Niagara.

At the eastern end of Lake Erie, the water flows by the grain elevators and steel mills of Buffalo. Then it funnels into another strait that we call the Niagara River. Here, the riverbed slants downward, and the water picks up speed. It surges on, churning through the upper rapids. Finally it reaches the brink of the falls and plunges over into the lower river some 160 feet below. It tumbles through the lower rapids, quiets, and finally winds its way into Lake Ontario.

Thus the river streams on — endlessly, powerfully, violently. So steady is the flow that it rarely rises or falls more than a foot or two, in winter or summer, in drought or flood. Its average flow of 205,000 cubic feet a second is unequaled in America and one of the mightiest on earth. The total energy of such a volume of water dropping over 160 feet is almost unbelievable. This fall of water produces enough energy in fifteen minutes to hurl a rocket into space; enough friction heat in one hour to boil 5,000 tons of water. If the water going over the falls were

dammed for forty-eight hours and released suddenly, it would smash Buffalo and its surrounding towns to bits and sweep them away to the sea.

NIAGARA POWER GROWTH TO 1847

Think of the countless hundreds of years during which this power tumbled into the river below the falls. For centuries the only men to gaze upon this awesome sight were Indians. Believing a mighty spirit controlled such power, they lifted outstretched arms in worship.

But while the Indians worshipped the power, Europeans who would use it cast eyes westward toward the New World. About 1615 French explorers paddled and portaged their way up the St. Lawrence and began their conquest of the interior of America. Even that early, Champlain made mention of a great falls to the west reported to him by the Indians. During the last quarter of the 17th century, La Salle and Father Hennepin became the first white men to tell of sighting the towering waterfalls in the Niagara River.

The French saw the falls not as a powerful spirit but as a magnificent yet impassable block in a river highway that halted their canoes. Without the falls, they could have paddled from the St. Lawrence to the upper lakes. The waterfall forced them to portage canoes and supplies seven miles around the cataract and rapids to the upper river.

Despite this block in the river, their trade with western Indians prospered as the years passed on. The French decided to stay in Niagara country. They built Fort Niagara, then Fort Little Niagara to command the river and portage — the gateway to the western fur trade.

These tiny outposts buried in the wilderness needed a supply of lumber for barracks, sheds, and boats. The French turned their thoughts to a sawmill and the power to run it. The task of building Fort Little Niagara and the mill fell to Chabert Joncaire, a French officer who became Master of the Niagara Portage after the death of his father.

He set about erecting the first mill to use water power from the Niagara River. He chose a millsite on the riverbank opposite the tip of Goat Island. Under his command, a gang of soldiers and Indians from Fort Niagara set to work. They scooped a narrow ditch from the river to the millsite and back into the river again. This mill-race, as such a ditch is called, carried the water to the millsite. In the mill-race they built a dam so the water had a six-foot drop. This drop, or head as we call it, produced power to turn the mill-wheel for what was probably a portable mill brought from France to the wilderness.

When the completed mill stood ready for use, the dam-control opened. Water gushed forth, the wheel turned, the saw moved up and down. Workers pushed logs into the teeth of the saw. Thus they cut the first planks in Niagara country. About this time, the French also set up another sawmill across the river where the Chippewa Creek rushes into the Niagara, foreshadowing the present day when twin plants on

First known view of Niagara Falls. From "Nouvelle Decouverte d'un tres grand pays" by Father R. P. Louis Hennepin, print dated 1697.

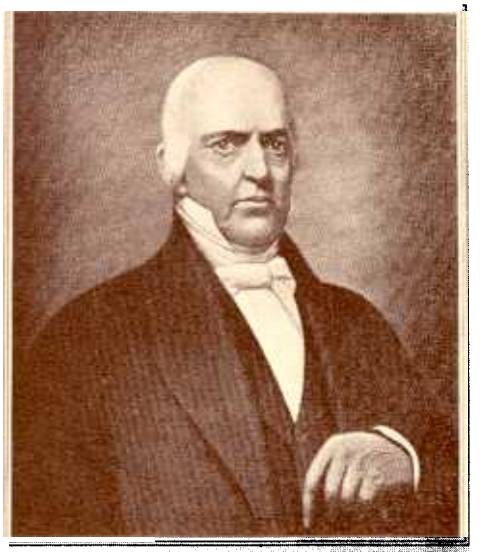
opposite banks would use the same river to produce power for industry.

But Joncaire's mill was to stand only two years in its wilderness clearing. The French and Indian War flared. By 1759, the British and French struggle for North America centered on the Niagara region. There, muskets sputtered and cannons roared as the British fought to take Fort Niagara. Joncaire destroyed his mill to keep it from falling into British hands. In late July, amid the yelps of excited Indians, a battered Fort Niagara surrendered to the British.

The new portage master, John Stedman, pressed by British demands for lumber, cleared the old mill-race and rebuilt the mill. But Stedman did little more than Joncaire to develop power. A great deal of history, including the Revolutionary War, marched by before the British left the region. In 1783 the British were still in control at Niagara. They surrendered Fort Niagara and the portage thirteen years later, when by Jay's Treaty of 1796, the boundary was outlined.

In 1795, the third man important to our story of Niagara power appeared. His name was Augustus Porter. As a youth he was too restless to be satisfied with life in a quiet Connecticut village. He turned outdoors and became a surveyor. In 1789, at the age of twenty-one, his life changed. His father, the village doctor, bought land on the New York frontier in Canandaigua.

Young Augustus roamed the forests in the course of his work. In 1795, he first sighted the waterfalls while surveying. Next year he was again back at Niagara Falls, gazing on the thundering might and thinking of the water waiting to be used. His imagination built a town by the falls, a mill town to use the endless power there. But in 1796,



Augustus Porter
1769–1845
Pioneer Surveyor, 1789
Power Pioneer of Niagara, 1806
First Judge of Niagara County, 1808

these were just the dreams of a young man.

Not until nine years later did Augustus Porter's dreams begin to take shape. He, his brother Peter, and two other men formed a company to transport goods across the old portage. From New York State they bought land and water rights along the Niagara River. This purchase gave the company control of a main transportation link between east and west, and sites for mills.

So Porter began his town. He dug a mill-race along the American rapids to supply water to the mills. He even named his settlement Manchester after the industrial city in England. With mills up, pioneers drifted into the settlement. By 1812, the raw frontier habitations of Manchester began to prosper.

In 1813, Porter's efforts disappeared in clouds of smoke. The war of 1812 had broken out between Great Britain and the United States the year before. In December 1813, in revenge for the burning of the settlement of Newark across the river in Canada, the British put the torch to the Niagara Frontier including Manchester. After the war, Porter rebuilt the mills. Then he developed more waterpower sites, not only along the American rapids but also on Bath (Green) Island. But trouble loomed for power growth at Niagara.

It arose in the shape of a canal, a canal that crawled slowly across New York State, bringing prosperity to most areas it touched. But the completion of this Erie Canal in 1825 ended prosperity at Niagara Falls. Using the canal instead of the old portage, freight now moved more quickly and more easily between Atlantic cities and the Great Lakes ports. There was no longer a need for Porter's portage. Industrial and power development at Niagara seemed doomed for now the village was off the beaten path. As a killing blow to Porter's dreams, the Erie Canal was also a source of power. When locks emptied, water gushed out and ran off. Since running water is a source of power, villages sprang up along the canal route.

One of these was Lockport. Because of its location on the busy Erie Canal and its easily harnessed water, Lockport became a power center. Porter's Manchester declined to a tourist attraction. It even lost the name Manchester to become Niagara Falls.

Despite the crippling effect of the Erie Canal, Porter did not abandon ideas of power development at Niagara Falls. In 1825, he set before bankers and manufacturers a vast plan to increase power by building a new mill-race for millsites. No one would back his plan with money. Except for some small development on Bath (Green) Island, power growth all but stopped at Niagara.

THE HYDRAULIC CANAL PROJECT 1847-1877

In 1847, Porter tried again. He planned a great raceway called a hydraulic canal. This would dwarf his other two raceways along the American rapids. The canal, large enough for small boats, would take water from the river above the rapids and carry it through the village to a water basin or reservoir located on the cliff just north of the falls. From the basin, water would rush into several mill-races which fanned out to touch the cliff's edge. After pushing water wheels in these mill-races, the used water would tumble into the gorge.

The plan was sound, but few people thought of Niagara Falls as a future power center. At that time, almost all businessmen in the Niagara country considered only Lockport with its surplus water from the Erie Canal. Porter even offered land for the hydraulic canal free. He had no takers. When he died in 1849, his plans lay collecting dust in some cubby-hole.

But the Porter family did not forget his plans. They kept the hydraulic canal offer open to whomever would build it. Finally, in 1852, two financiers, Caleb Woodhull of New York City and Walter Bryant of Boston, accepted the family's offer. In the spring of 1853 they organized the Niagara Falls Hydraulic Company to begin digging the canal. A

third man, Stephen Allen, joined the company. But for these men and most who followed, the canal caused heartbreak, worry, financial ruin, and for some, death.

In 1853 construction of the hydraulic canal began. Day after day, month after month, the drilling, blasting, shoveling, and hauling continued. With painful slowness, men blasted the canal through the village of Niagara Falls. In time the canal seemed like a living thing, bent on ruining those who tried to tear out the rock.

It ruined the Hydraulic Canal Company. Digging took longer than the company men figured. And the canal gulped money faster than they could pour it in. With the "ditch" nowhere near complete, money ran out. The company faced bankruptcy. Woodhull and Bryant shook their heads, accepted defeat, and left the scene of their failure. Only Stephen Allen still had the will to fight.

In 1856 Allen finally succeeded in interesting others in the canal and Niagara power. A new company, the Niagara Falls Water Power Company, took over the partly completed canal. Allen headed the company as president, with Horace H. Day, vice-president and treasurer, as second in command. By the spring of 1857 they had blasted the canal through to the cliff below the falls.

The company had already completed the area around the canal mouth which they called Port Day. They decided to celebrate the opening of Port Day on July 4. This would draw wide attention to the canal and perhaps interest businessmen in Niagara power.

The Fourth came. Officials stood on a platform addressing the crowds. One after another the speakers arose and hailed the opening of Port Day. They all spoke of the great future of the village as a port and power center.

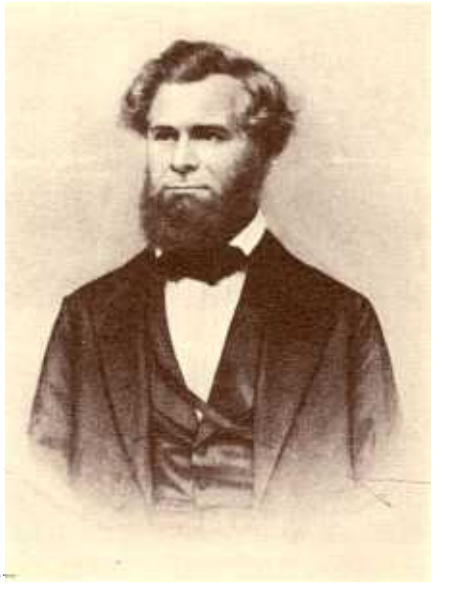
Their hopeful words, however, did not make it come true. Allen's company, drowning in debt, faced ruin. It hung on for three years, then quietly sold out in 1860, amid the rising hysteria of Civil War. Allen withdrew from the canal he had spent seven years trying to create. Horace Day decided to go on with the fight to complete the hydraulic canal. He was to struggle harder and longer with the canal project than any other man.

His financial resources wavering, Horace Day organized a third company, the Niagara Falls Canal Company. It began to attack the bedrock where the canal basin and millsites would be built. For seventeen years, when money permitted, Day pushed the canal onward. He poured more money into it — his own and all that he could borrow. He kept his faith in the future of the village as a power center.

But he was about the only one. As the years passed, those who had cheered the opening of Port Day, now insulted and ridiculed the "ditch." Most people doubted that it would ever be finished. It was an eye-sore of ugly rock and clay piled through the village. People fre-

quently tumbled into it. Village officials and citizens grumbled over the canal and some demanded that it be filled in.

Against all this, Horace Day somehow held on. Finally in the spring of 1875, he completed the canal basin and mill-sites. His time of triumph should have arrived. He placed an advertisement in the Niagara Falls *Gazette* offering power sites for sale. However, the expected lines of customers clamoring for millsites failed to appear.



Horace H. Day.

In the end, Horace Day had only one buyer. His name was Charles B. Gaskill, Civil War veteran and miller. At his millsite, Gaskill dug a twenty-five foot shaft and at its bottom put in an improved water wheel called a turbine. Water from the canal basin rushed through a mill-race, plunged down the twenty-five foot shaft onto the turbine, setting it awhirl. It gushed through the turbine, ran out a tail-race tunnel, and poured from the face of the cliff into the river some 200 feet below.

Gaskill's flour mill was a success. But no other men turned the doorknob of Horace Day's office looking for power sites. Since one mill could not pay for the hydraulic canal, ruin overtook Day in 1877. His creditors seized the canal and tried to salvage some money at a public auction.

On a spring day in May 1877, Horace Day watched seventeen heartbreaking years pass under the auctioneer's hammer. A total investment of some $1,500,000 went for $71,000 to a group of businessmen headed by Jacob F. Schoellkopf of Buffalo. Schoellkopf later added another $5,000 to the sum.

THE GROWTH OF HYDRO-ELECTRIC POWER, 1877-1925

What Day lost, Jacob Schoellkopf gained. He ignored those who reminded him that the project had already wrecked three other companies. A progressive and successful merchant and manufacturer, he could read the signs. The signs pointed to good times. The depression of 1873-76 had ended and the nation stood on the edge of a great industrial boom. Schoellkopf had prospered in his Buffalo leather business because he knew very well what he was doing.

Schoellkopf and his associates organized a fourth company to develop Niagara power, the Niagara Falls Hydraulic Power and Manufacturing Company. Four and a half years after taking over Day's canal, the com-

Widening the Hydraulic Canal across the City of Niagara Falls was no easy job in the 1890's.

pany took a small step that made Niagara Falls a world leader. They built an electric generating station in the J. F. Quigley pulpmill on the cliff bank. Electricity from this generating station supplied power to an arc-light machine in the Brush Electric Light and Power Company. Thus in 1881, the first commercial production of hydro-electricity began.

People were excited over it. Several local businesses took advantage of the novelty and installed electric lighting. One customer, the Niagara Falls *Gazette,* ran a big story on electric lighting. Orders from other businesses kept the small Brush Electric Light and Power Company busy, but it was still not a major industrial influence.

Most factories still used power supplied by their own individual water wheels. With every factory using its own wheels for power, there was no rush to install electricity. But in that year unseen forces were at work. They would move men to decide to create a central station to replace individual water wheels as industry's source of power. One was natural industrial growth. Schoellkopf's success at winning customers and developing millsites created a demand for more power. Soon the canal basin, Bath Island, and the land along the American Rapids had about reached the limit of productive expansion. It was clear that more power sites were needed for industrial growth to continue.

The second force that was to pressure power men into deciding on a central station was New York State. In 1885, four years after the successful generation of hydro-electricity, the State bought Goat Island and the land along the American rapids for a State park. The purchase removed many millsites. The only important power sites left were on the cliff bank. Men began to look seriously for another source of power. They gradually came to view a central station transmitting power to industries as the only solution.

The first step toward developing electricity in a central power station began with Thomas Evershed. In February 1886 Evershed, an engineer on the Erie Canal, sent a letter to a Lockport newspaper. His letter presented a plan which could create many new power sites. His plan, basically, still required use of individual sites where mills could get water to generate their own power and so run their machines.

Evershed's plan called for channeling water from the upper river into twelve parallel surface canals. Each canal would have a dozen or more power sites where water would plunge into deep pits and spin turbines at the bottom. Then the spent water in each wheel pit would gush into a huge underground tunnel. This tunnel, some two and a half miles long, would carry the used water beneath the City of Niagara Falls and dump it into the gorge. In all, Evershed's plan would provide sites for 238 mills and produce 119,000 horsepower. Here seemed to lie the answer to the problem of power sites. Leading men in the community took note.

Charles B. Gaskill.
Colonel, U. S. Army, Civil and Spanish-American Wars.

Charles Gaskill, for one, thought the plan a good one. He decided to do something about it. He set about selling other men the idea, not only in Niagara Falls, but in Buffalo, Boston, and New York. With Gaskill as president and Evershed as engineer, these men organized the Niagara River Hydraulic Tunnel, Power and Sewer Company in the summer of 1886.

Three hectic years slipped by before the company gathered men, blueprints, equipment, and money for such an immense project. Before construction started, the Niagara River Hydraulic Tunnel, Power and Sewer Company reshaped itself as the Niagara Falls Power Company with Gaskill as president. The Cataract Construction Company was formed to carry out the enterprise. Edward Dean Adams, a director of the power company, become president of the construction firm.

They did not wait to solve all the problems involved in the development and transmission of power. Whatever form would be used would need a water inlet and a water discharge. Plans and surveys had to start immediately. So finally, in October 1890 began the project that made Niagara Falls a world-famous hydro-electric power center.

The Evershed plan soon involved Gaskill in problems. Again the old money dragon reared its head. Like Horace Day, Gaskill and Evershed found blasting out bedrock a ruinous task. The Evershed tunnel cost more than the hydraulic canal that had destroyed Horace Day. Besides, could the company sell enough power and sites to make money? A village of 5,000 people could not possibly use enough power to make the project pay. This was Day's problem being repeated.

To carry out the Evershed plan meant certain ruin. Officials huddled over the problem, arguing, discussing, planning. They came up with a bold decision suggested earlier by others. They gave up the old way of each mill generating its own power. Abandoning the direct use of water power, they drew plans for a central generating station. This would send power to factories scattered throughout the village and even to Buffalo, twenty miles away.

The Evershed plan had served a purpose. It had led to the decision to replace direct water-power with hydro-electric power. The only thing that remained of the original Evershed plan was the tunnel and this was shortened.

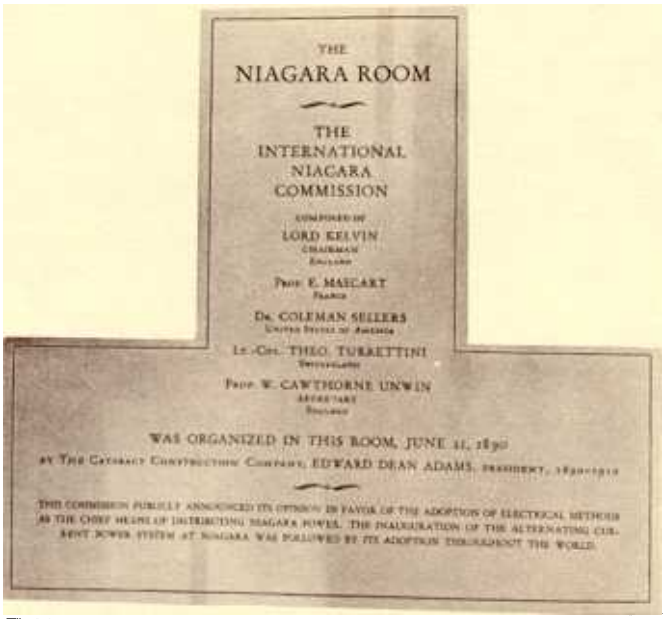
The new plan called for a central generating plant above the American rapids, near the intake of Horace Day's hydraulic canal. The plant would draw water from the river, drop it down deep shafts to turbines. The used water from the turbines would then pour through the tunnel under the city, and would finally gush into the gorge below the falls.

One big question still plagued the Niagara Falls Power Company and other producers. How could electric power be sent long distances? The Brush Electric Light and Power Company, as well as companies in Europe, had proved that it could be transmitted short distances. But could it be sent to Buffalo? Without the Buffalo market, the project would not be successful.

So invitations went forth for companies to suggest a workable system for sending electric power long distances. For the best solution went prize money. The International Niagara Commission, backed by the Cataract Construction Company, met in London in 1890. There gathered some of the best scientific minds in Europe and America. Their task was to determine which of the proposals sent in from twenty representatives of six countries could be recommended for the hydraulic development at Niagara and for the distribution of power.

A fight then raged over whether to use alternating current or direct current. Men of genius took both sides. Thomas A. Edison supported direct current and George Westinghouse, alternating current. After examining all the suggestions for the power project, the commission agreed that electric power transmission over long distances was best by alternating current. They recommended larger generators as new projects were prepared. No final proposal regarding distribution of power resulted from the commission's meetings, but suggestions resulted in the adoption, two years later, of a system at Niagara which is followed everywhere, today.

The Cataract Construction Company, after receiving the reports of the International Niagara Commission, finally decided to use alternating current to transmit electric power to Buffalo and locally. Plans for the power station moved ahead.



Tablet on inside of entrance door, Brown's Hotel, London, erected in Commemoration of the International Niagara Commission.

Once decided on this question, the company attacked other problems. The question of sending high voltage all but brought plans to a halt. Voltage had to be high to get to Buffalo, but high voltage burned up electric motors. The problem was solved by using transformers. Transformers raised the voltages and sent it on its way to Buffalo. At Buffalo, other transformers lowered the voltage. The electricity was then usable in small amounts.

While this was going on George Westinghouse, working on Nikola Tesla's patents which he had the foresight to buy and use, was busy at his drawing board. His was the difficult job of plotting the building of electric generators for the central power station. Working drawings for turbines came from one of the prize-winning firms in Geneva, Switzerland, and manufacture of them in America began.

For five years the company, still under Gaskill's direction, fought rock and puzzled over electrical and building problems that men had never faced before. With each success, they pioneered a step forward in hydro-electric power transmission. Finally, in the late August heat of 1895, an anxious group of men filled power house No. 1 on the upper river. Switches were thrown and the first electricity flowed to a factory in Niagara Falls, the Pittsburgh Reduction Company.

A little over a year later, on the morning of November 16, 1896, the company achieved its goal. Electricity flowed to Buffalo. The city and its manufacturers, badly in need of power, greeted the news joyously.

Buffalo was prepared to receive Niagara power. George Urban Jr. and Charles R. Huntley, together with William B. Rankine, a New York lawyer who later moved to Niagara Falls, had formed the Cataract Power and Conduit Company in 1896. With Urban as president, the company planned to distribute the Niagara power sent to Buf-

Main Street, Buffalo, 1892, showing horse-drawn and electric trolley cars.

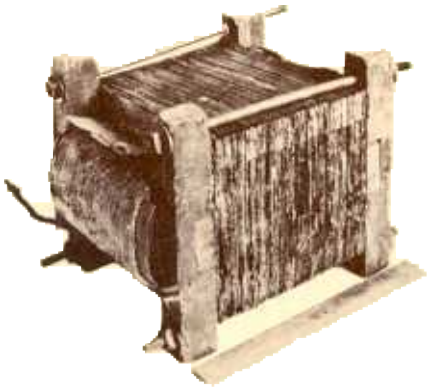
falo. They built a terminal house to handle 1,000 horsepower of electricity. On November 16, 1896, electricity sped through the wires from Niagara Falls to this plant. Early among its customers was the new electric street railway which spelled doom to the horse-drawn streetcars in Buffalo.

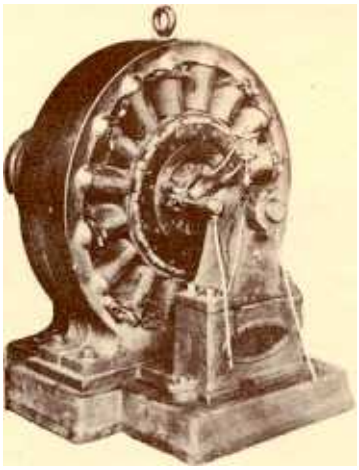
Niagara Falls power men also celebrated their victory, although transmitting electricity to Buffalo was only part of their plans. They still hoped to harness most of Niagara's might, and dreamed of great future uses. Nevertheless, 1896 was a time for pride and congratulations.

Their celebrating, however, soon ended. A power shortage developed. Even the 34,000 horsepower developed by Schoellkopf's newly-built plant did not help much. Two new power plants were added in Niagara Falls in 1896. Still there was not enough to meet the demand.

In the 1880's and 1890's, industries were finding new ways to use electricity. Instead of just for lighting and running machines, they began to use it directly in making chemicals. Sending an electric current through chemicals produced materials not found in nature. This new use of electricity resulted in electro-chemical companies. In Niagara Falls and Buffalo such companies began to establish plants and to increase the demand for more and more electricity.

The whine of turbines and generators continued day and night. But their frantic whirl did not produce enough electricity. Power men, who saw the falls as energy being wasted, decided it ought to be put to use. Again they set to work. Plans for greater use of Niagara's water took shape around conference tables. Drafting boards gave birth to new turbines to withstand the smashing force of water falling from great heights.





"AC" generator installed by Westinghouse in Brush Electric Co. station to create power to light the Adam, Meldrum & Anderson Co. store, Buffalo, and transformer used, Nov. 26, 1886, the first commercial alternating current installation in the U.S.—Adam, Meldrum & Anderson Co. photographs.

Convinced that there would be further demands for considerable power, the directors urged that the Niagara Falls Power Company develop power on the Canadian side of the river in Queen Victoria Park. Negotiations were entered into with the Canadian authorities concerned for the right to construct such a plant and to export its electricity to the United States. The first 10,000 horsepower of electricity was delivered from this Canadian Niagara Power Company plant on January 1, 1905, to the Niagara Falls Power Company.

In their planning to increase the power output of the falls, they ran up against a group of people devoted to the beauty of nature. In 1885, this group urged the State to create a park at the falls. They feared power men might channel all the water from the river into turbines. To nature lovers this would be disaster.

The battle over the use of river water began. It raged in England, the United States, and Canada, the nations controlling the Niagara River. Rival groups turned to the public to support their views. Finally they took the fight to lawmakers. When the air cleared, nature lovers held the field. The United States Congress passed the Burton Bill of

The Niagara Falls Hydraulic Power & Manufacturing Co., 1902.

1906 which New York State accepted. This law limited the amount of water that could be diverted from the river. In 1910, the United States and Canada signed the Boundary Waters Treaty. By this treaty a commission would decide how much water could be used by each nation without destroying the beauty of the cataracts. These two laws curbed reckless use of the Niagara River.

At this very moment across the Atlantic, however, events were shaping the destiny of Niagara power. In 1914 Europe exploded into World War I. For three years the British and French allies held the Germans at bay. In 1917, American soldiers marched to war to help make the world safe for democracy. From the outbreak of the conflict, factories in America began to pour out supplies. There was an ever-increasing demand for power to make more goods which pushed power companies to their fullest. They reached a point where an increase in power meant taking more river water. The new laws blocked their efforts. So they called on the government for help.

A federal commission stepped off the train at Niagara Falls. After studying the problem, it asked power men to submit plans for more efficient use of the water permitted by the Treaty of 1910. The commission received several plans. The Schoellkopf company suggested using its site below the high cliff. This site had a greater fall of water than the Edward Dean Adams station of the Niagara Falls Power Company. The commission accepted the Schoellkopf company's plan. But to avoid arguments over water rights between the two companies, the commission asked them to merge or combine.

The Niagara Falls Power Company and Schoellkopf's Niagara Falls Hydraulic Power Company bowed to the government's will. In 1918, the combined companies took the name Niagara Falls Power Company.

The larger company immediately began building an additional plant, Schoellkopf Station 3B, at the foot of the cliff. This station had three 37,500 horsepower generators. It was 1920, however, before the Station 3B was completed. With its completion, the Adams plant on the upper river was held in reserve. All the water allowed by the treaty of 1910 passed through the Schoellkopf stations at the foot of the cliff.

But the plans for power production were not finished. The company was granted a license in March 1921, to build a third station in the gorge, Station 3C. This was to have three 70,000 horsepower generators. Water was to be supplied directly to this station by a 4,440 foot long tunnel 32 feet in diameter. By 1925, the Niagara Falls Power Company had increased its power tremendously. With the use of river water limited by law, power growth after 1925 took place mainly through mergers.

POWER DEVELOPMENT IN BUFFALO

The story of power in Buffalo also, during this time, was mainly one of mergers. Buffalo companies attempting to be independent found

the cost ruinous. At first, several served the same area. Each strung power lines, built turbines, generators, and transformers. They battled one another for customers, often cutting prices below cost to win business. It was soon clear that competition was the road to destruction. With baukruptcy awaiting them, worried men gathered to seek a solution. They found it in merging which ended costly competition.

Jacob F. Schoellkopf.

The Cataract Power and Conduit Company, which first received Niagara power in 1896, illustrates this growth through mergers. This pioneer company ran into trouble soon after being organized. Few men knew how to handle electrical problems. When transformers, switches, and wiring burned out, the company had difficulty in making repairs. Sale of electricity lagged; profits slipped. Competition stiffened.

In a few years, however, electro-chemical industries in Buffalo created a demand for more electricity. Output and sales increased. The company had trouble getting enough power. Its steam-driven turbines could not meet the demand. The company hounded the Niagara Falls Power Company for an additional 5,000 horsepower, but this could not be supplied. The power company's plant in Canada was able to send some electricity to Buffalo, but the city company was still hampered.

By 1915, the Cataract Power and Conduit Company saw merging as the answer to growth problems. That year the company, as three electric light companies had done earlier, merged with General Electric of Buffalo. Thus General Electric became Buffalo's largest power company. By 1920, many Buffalo companies had merged.

Power men began to ask themselves why they should not merge power companies in different cities, thus forming a more efficient company. They set to work on the question. A giant corporation was born a few years later. In 1925 the Buffalo, Niagara and Eastern Power Corporation took over General Electric of Buffalo and the Charles R. Huntley generating plant near the Niagara River. The corporation also took over the Niagara, Lockport and Ontario Power Company. The Tonawanda Power Company, distributor for the Niagara Falls Power Company, joined the corporation. For twenty-five years this Buffalo, Niagara and Eastern Power Corporation controlled most power generation and transmission in the area.

THE NIAGARA POWER PROJECT, 1950-1961

In 1950, one more important merger took place. During World War II Buffalo, Niagara and Eastern had expanded production. After the

war, seeking greater operating economy and cheaper power for customers, it merged with other companies. Niagara Hudson, which had given twenty-five years of service was dissolved in 1945-50, and the giant Niagara Mohawk Corporation was born. This marked the peak of power development through mergers. From that point on, greater power increases came mainly from the use of more river water. This, in turn, meant new laws and another boundary water treaty with Canada, co-owners of the river. Canada also, in its Ontario Hyro Commission plant, had expanding need for river water. This raised the old battle cry of nature lovers about the waterfalls.

While Niagara Mohawk was taking shape, New York State and Canada undertook the task of slowing the wearing away of the falls. The purpose was to save the falls from further erosion, but perhaps there was some way to increase water usage at the same time, and still not lessen the beauty of the falls.

Officials on both sides of the river discussed the problem. They finally worked out the details in the United States-Canadian Boundary Waters Treaty of 1950. By this treaty they planned to slow erosion by reducing the flow of water over the falls and spreading it more evenly along the whole crest by control structures above the falls. In daytimes, in the tourist season, 100,000 cubic feet of water per second (c.f.s.), necessary to preserve the beauty of the cataract, would rush over the falls. At nights and during winter, when fewer people viewed the falls, 50,000 c.f.s. would flow. All other water would be divided between the two nations for power use.

In the United States, water to generate the power was to be taken from the upper Niagara River. It would then flow over four miles to a generating plant at Lewiston through ditches, which were later replaced with underground tunnels huge enough to carry a fleet of yachts. At night much of the river water would rush through these conduits. Part of the night water would be pumped into a vast reservoir. During the day, the pumps would be converted into generators when water flowed from the reservoir to the main generating plant at the foot of the gorge. The rest of the night supply would spin generators in the main plant.

Thus in daytime, when the river rushed over the crest, visitors would view the Canadian Horseshoe Falls and the American Falls in all their beauty. Water to run the turbines during the day would be drawn mostly from the reservoir filled the night before. This plan would produce some 2,190,000 kilowatts of electricity and yet save the beauty of the falls. Both power men and nature lovers were satisfied.

With such a good plan, the road ahead seemed clear for construction to begin. Canada did start construction on the new Sir Adam Beck plant and reservoir on its side of the river. Construction in the United States, however, was delayed for years. The treaty failed to say who would

Conduit #1 Niagara Power Project under construction, September 1959—Power Authority—State of New York.

develop the power in the United States. One American group wanted private industry to do it. Another group thought that New York State should build the power project, while a third group favored Federal development. Finally both sides set their cases before United States' lawmakers. Canadians, meanwhile, finished much of their work and began enjoying profits by selling the much-needed electricity to squabbling Americans.

A power disaster finally forced Congress to act. In June 1956, a huge rockslide swept much of Niagara Mohawk's Schoellkopf plant into the gorge. Power production was badly crippled. Since by agreement, either country could divert the entire allowed amount of water to its own use until the other country developed its plant, Canada could now claim most of Niagara's power. Faced with this crisis, Congress gave the right to develop Niagara's power to the New York State Power Authority.

Getting the right to develop the power was only the beginning of the Power Authority's problems. The city of Niagara Falls and Lewiston fought the Authority's plan to build open ditches through part of the city. They declared them dangerous. So the Authority built conduits under ground. It also agreed to build parks and playgrounds over the conduits.

Next the Authority faced problems with regard to the location of the reservoir. The city did not wish city property removed from tax-rolls, as it would be if taken over by the Authority in the public interest. Part of the Tuscarora Indian Reservation was selected for the reservoir. The Indians refused to sell, as they said that treaties with the Federal Government protected them from having their land seized. The courts, after lengthy lawsuits, recognizing the importance of the land to the power project, ruled against the Indians.

The Indians protested the decision and the police had to be called out to protect surveyors and other workers. Meanwhile, the Tuscaroras won an appeal; the courts ordered the Authority from the land. So the Power Authority began to build a smaller reservoir.

The Authority pressed the legal fight. Indian land, they told the courts, was vital to full development of power. Without it, power output

Sir Adam Beck No. 1 and No. 2 as seen from the Robert Moses Plant.
—Power Authority of the State of New York.

would be cut down. In 1960 the Power Authority, headed by Robert Moses, won the final round. As had happened countless other times in history, Indians' rights gave way before the advance of white man's civilization.

Like the Tuscaroras, other land and home owners and communities fought to keep their property. Property losses cut the annual income of towns and city, upsetting municipal budgets. Authority lawyers met each challenge, winning most cases. The Authority, they argued, is a public service. As a non-profit organization, it is free of taxes. The Authority won.

While legal battles raged, construction began in the cold March of 1958. Surveyors moved in to mark the right-of-way for the project. Bulldozers, cranes, trucks, and tractors crawled over the right-of-way. Men and machines pounded, scraped, blasted, dug, hauled, poured, and built. Like an army of ants viewed from the height of the Lewiston escarpment, strange and monstrous machines changed the aged face of the gorge. They brought into being a beautiful, clean, gigantic face to match the sentinal on the opposite side of the gorge. Twin giants, the Canadian Sir Adam Beck and the American Robert Moses plants, born of the same mother, Niagara, rose as symbols of the twentieth century — harnessed power.

Slowly over an area too vast to see from one point, they pieced together the project — conduits, holding basin, generating plant. Then, tying the whole together, the new Niagara Parkway swept north along the river. Built partly on rock dumped from tunnels and reservoir into the river, it moves by the towering conduit intake gates and continues to the new bridge to Goat Island. It passes the glass-enclosed observation tower near Prospect Point. Under the Rainbow Bridge, by old Niagara University, past the generating plant, through a cloverleaf at the International Power Bridge at Lewiston, it runs to finally reach Lake Ontario.

For a time, during a brief January thaw in 1961, attention focused on a small group in the generating plant at the bottom of Lewiston gorge. For a few moments, the work of thousands of men and machines centered on this spot. Here, the immediate success of the enormous project hung in doubt. Here, waited the most important moment in the whole building program.

Surrounded by partly completed construction was a group of some twenty men whose companies had built the project. They had gathered to test Generator No. 1. They would also test whether the cost in money and human lives was worth the effort. Would it work, or would there be disappointment and costly delays?

They had planned carefully, the tons of blueprints proved that. But an imperfection anywhere might mean failure. A minor flaw in some small detail, a moment's carelessness by someone, somewhere, would mean failure. Such large generating equipment had special problems. Was it too big to operate under the fall of water available? The turbine rotor is some eighteen feet wide with some 198 moving parts and the weight of a freight locomotive. Was it designed right? And what of the generator? It is nearly 36 feet wide and its moving parts weigh some 668 tons, the weight of a small lake steamer.

At six p.m., January 12, the countdown began that answered their questions. Engineers with testing devices stood by telephones ready to halt the test if trouble developed. A quiet and tense group waited for the final test to begin. A hand moved. From three hundred feet above, tons of water pressed through the twenty-four foot wide penstock and into the turbine at the bottom of the gorge.

Slowly, the giant turbine began to move, and with it the steel shaft connected with the generator above. Seconds slipped into minutes. With each passing moment, tension eased. No report of trouble. Smiles spread over the faces of the group. Gradually, they increased the speed of the turbines. In the generator house above, the generator began to hum. As speed increased, the hum became like the roar of a jet bomber. It filled the gorge. When the tests finally ended, the generator was whirling at a blurring speed.

Robert Moses Niagara Power Plant. -Power Authority of the State of New York.

On February 10, this generator sent 150,000 kilowatts of electricity flowing into Western New York. This time the public attended. They saw the flags, the parade of confident officials, and heard congratulatory words. While flash bulbs blinked, they saw a smiling Governor Rockefeller pull the switch that sent electricity on its way. They read more about it later in newspapers. But the big excitement had taken place a month earlier at the bottom of the gorge.

While these events took place, work continued on the vast power project. Slowly over the months the thirteen main generators went into operation.

The conquest has come. But it has not destroyed Niagara Falls. Power men and nature lovers are satisfied. The dreams of Chabert Joncaire, Augustus Porter, Horace Day, Jocob Schoellkopf, Edward Dean Adams, Robert Moses, and the many other power men have come true. Niagara has yielded its gift—a gift of power.

Mural depicting Father Hennepin at Niagara Falls in the year 1678, in Overlook Building, Niagara Power Plant, Lewiston, N. Y. (Photo—Power Authority, State of New York.)

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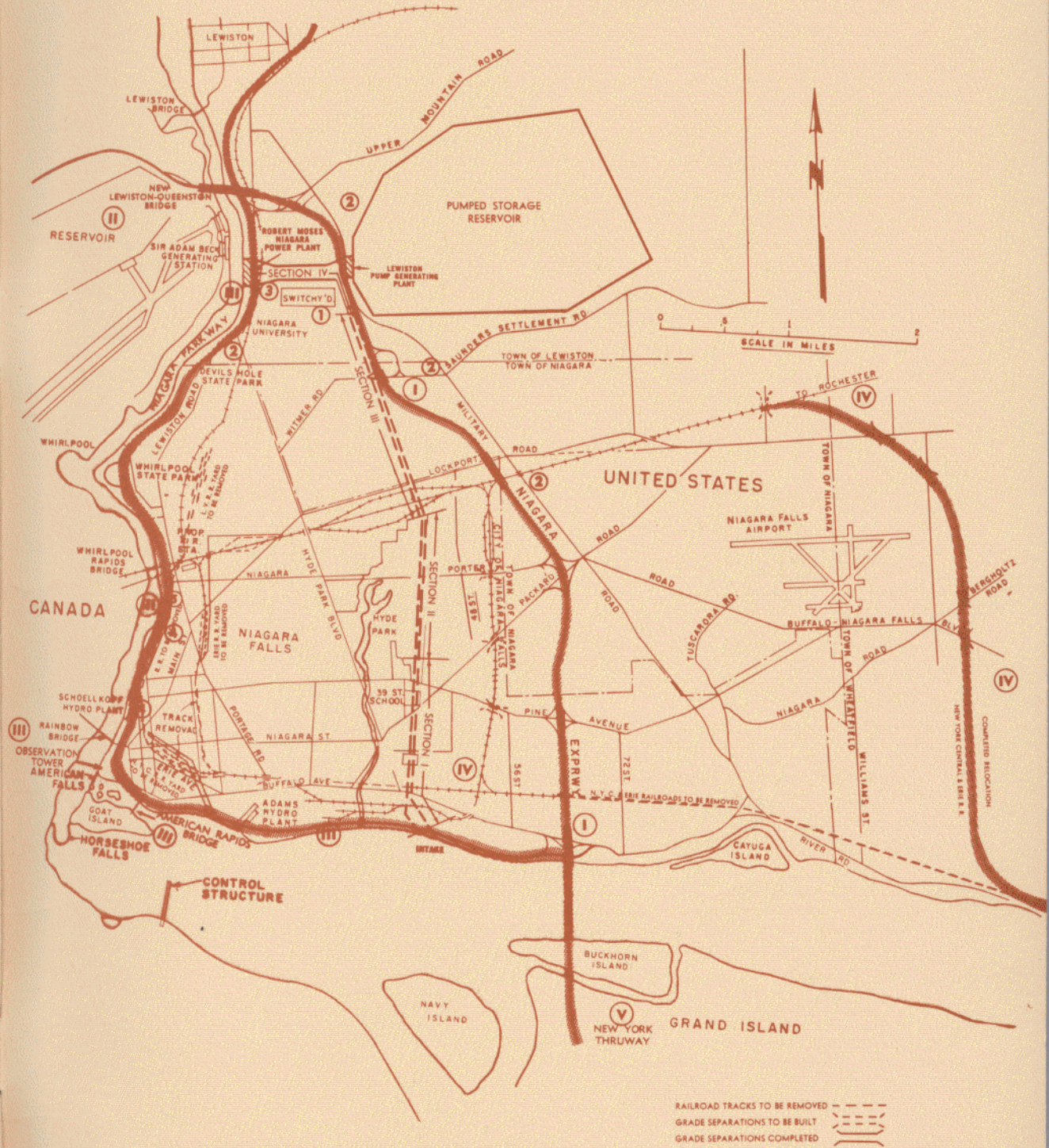

Niagara Falls, New York, showing Robert Moses Niagara Power Plant and improvements incidental to the power project (I) Niagara Expressway from North Grand Island Bridge to new Lewiston-Queenston Bridge; (II) New International Bridge connecting Lewiston, N. Y. and Queenston, Ont.; (III) Niagara Parkway and power facilities along Niagara River; (IV) Niagara Falls Highways and Railroad grade crossing elimination program; (V) New York Thruway. Map—courtesy Power Authority of the State of New York.